What Is Claimed Is:

1. A three-dimensional confocal microscope system comprising:

a confocal scanner for obtaining sliced images of a sample as confocal images;

a video rate camera for converting said confocal images to a video signal;

an image processing unit for converting said video signal to image data;

an actuator for moving the focal position of a microscope's objective lens in the optical-axis direction; and

control means for generating scanning waveform signals used to scan said objective lens in the optical-axis direction through said actuator;

so that sliced images of said sample in the depth direction can be obtained, wherein said control means generates a triangular or step-like scanning waveform signal which has been corrected so that acceleration is kept virtually constant at discontinuous points of change in said scanning waveform signal and said actuator is driven by said scanning waveform signal.

2. The three-dimensional confocal microscope system of claim 1, wherein said scanning waveform signal generated by said control means is corrected with a quadratic function so that displacement s of said scanning waveform signal satisfies

$$s = a \cdot t^2/2$$

where t is an elapsed time and $a = S/T^2$ (S is the scanning stroke of said objective lens and T is the duration of the downward

slope of said scanning waveform signal),

at discontinuous points of change in said scanning waveform signal and that acceleration is kept virtually constant.

3. The three-dimensional confocal microscope system of claim 1 or 2, wherein said control means comprises:

a waveform calculation unit for determining by calculation the waveform of said triangular or step-like scanning waveform signal;

an arbitrary waveform generator for storing and generating said scanning waveform in synchronization with a scanning waveform generation trigger signal;

an actuator driver for driving said actuator according to said scanning waveform generation trigger signal output from

said arbitrary waveform generator; and

a signal controller for generating trigger signals synchronized with the video signal of said video rate camera and supplying said trigger signals to respective corresponding units.

4. A three-dimensional confocal microscope system comprising:

a confocal scanner for obtaining sliced images of a sample as confocal images;

a video rate camera for converting said confocal images to a video signal;

an image processing unit for converting said video signal to image data;

an actuator for moving the focal position of a microscope's objective lens in the optical-axis direction; and

control means for generating scanning waveform signals used to scan said objective lens in the optical-axis direction through said actuator;

so that sliced images of said sample in the depth direction can be obtained, wherein said control means generates said scanning waveform signal at least once within the period of said video signal's vertical synchronization signal.

5. The three-dimensional confocal microscope system of claim 4, wherein said scanning waveform signal is an isosceles triangle shaped wave.

6. The three-dimensional confocal microscope system of claim 4 or 5, wherein the period of said scanning waveform signal is an integral submultiple of the period of said vertical synchronization signal.

7. The three-dimensional confocal microscope system of claim 4 or 5, wherein the turn-around points of said scanning waveform signal have waveforms created by means of S-curve control.

8. A three-dimensional confocal microscope system comprising:

a confocal scanner for obtaining sliced images of a sample as confocal images;

a video rate camera for converting said confocal images to video signals;

an image processing unit for converting said video signals to image data;

an actuator for moving the focal position of a microscope's objective lens in the optical-axis direction; and

control means for generating scanning waveform signals used to scan said objective lens in the optical-axis direction through said actuator;

so that sliced images of said sample in the depth direction can be obtained, wherein said control means produces an isosceles triangle shaped wave whose period is an integral multiple of the period of said video signal's vertical synchronization signal as said scanning waveform and said image processing unit

integrates or averages said obtained sliced images.

9. A three-dimensional confocal microscope system comprising:

a confocal scanner for obtaining sliced images of a sample as confocal images;

a video rate camera for converting said confocal images to video signals;

an image processing unit for converting said video signals to image data;

an actuator for moving the focal position of a microscope's objective lens in the optical-axis direction; and

control means for generating scanning waveform signals used to scan said objective lens in the optical-axis direction

through said actuator;

so that sliced images of said sample in the depth direction can be obtained, wherein said image processing unit synthesizes said sliced images according to displacement signals output from said actuator to produce a three-dimensional image.

10. A three-dimensional confocal microscope system comprising:

a confocal scanner for obtaining sliced images of a sample as confocal images;

a video rate camera for converting said confocal images to video signals;

an image processing unit for converting said video signals to image data;

an actuator for moving the focal position of a microscope's objective lens in the optical-axis direction; and

control means for generating scanning waveform signals used to scan said objective lens in the optical-axis direction through said actuator;

so that sliced images of said sample in the depth direction can be obtained, wherein said control means calculates acceleration when said actuator is displaced, according to displacement signals output from said actuator, and controls said actuator so that said acceleration does not exceed a preset value.

11. The three-dimensional confocal microscope system of claim 9 or 10, wherein said control means comprises:

an waveform calculation unit for determining by calculation

the waveform of said scanning waveform signal;

an arbitrary waveform generator for previously storing said scanning waveform and generating said scanning waveform in synchronization with a scanning waveform generation trigger signal;

an actuator driver for driving said actuator according to said scanning waveform generation trigger signal output from said arbitrary waveform generator; and

a signal controller for generating trigger signals synchronized with the video signals of said video rate camera and supplying said trigger signals to respective corresponding units; and

an A/D converter for converting said displacement signals to displacement data and outputting said displacement data

to said image processing unit and said waveform calculation unit.

12. The three-dimensional confocal microscope system of claim 10, wherein if said calculated acceleration exceeds said preset value, said control means increases the time required for said actuator to return from the maximum displacement to the minimum displacement so that the time is an integral multiple of the period of vertical synchronization signals contained in said video signals.

13. The three-dimensional confocal microscope system of claim 9 or 10, wherein said scanning waveform is a triangle wave and the discontinuous points of change in said triangle wave have

waveforms created by means of S-curve control.

14. The three-dimensional confocal microscope system of claim 9 or 10, wherein said scanning waveform is a step wave and the discontinuous points of change in said step wave have waveforms created by means of S-curve control.